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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,480	12/20/2001	Kazuo Hirose	WAKI-203	2161

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EXAMINER	
LAVARIAS, ARNEL C	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/034,480	HIROSE ET AL.	
	Examiner	Art Unit	
	Arnel C. Lavarias	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2004 and 16 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-11 and 16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-11 and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/16/03 has been entered.

Response to Amendment

2. The amendments to the specification of the disclosure in the submission dated 12/16/03 is acknowledged and accepted. In view of these amendments, the objections to the specification in Section 4 of the Office Action dated 3/18/03 are respectfully withdrawn.

3. The amendments to Claims 1, 10-11 in the submission filed 12/16/03 are acknowledged and accepted.

4. The cancellation of Claims 2, 12-15, 17-20 in the submission filed 12/16/03 is acknowledged and accepted. In view of these amendments, the objections to the claims in Section 7 of the Office Action dated 9/17/03 are respectfully withdrawn.

Response to Arguments

5. The Applicants argue that, with respect to newly amended Claims 1 and 10, Hayakawa et al. fails to teach or reasonably suggest an optical pick-up and a lens holder for an optical pick-up, the lens holder having a bearing part and a lens receiving surface, the bearing part having a bearing surface disposed vertically to the lens receiving surface. The Examiner respectfully disagrees, and notes that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In the instant case, Ikegame et al. discloses an optical pick-up (See Figures 2, 3, 9, 10) including a lens holder (See 6 in Figure 10) having a bearing part (See the bore of 6 which is engaged with shaft 12 in Figure 10), the lens holder including a lens receiving surface (See surface on which element 21 rests in Figure 10), and the bearing part having a bearing surface disposed vertically to the lens receiving surface (See surface on which element 21 rests and the bore of 6 which is engaged with shaft 12 in Figure 10). Hayakawa et al. is not being relied upon to teach these features, and instead is being relied upon for the teachings of a gate at an end of the bearing part being disposed at an opposite side of the lens receiving surface and disposed parallel to an inside perimeter of the bearing part.

6. The Applicants argue that, with respect to newly amended Claim 11, Hirose et al. in view of either Tachikawa et al. or Makabe et al. fail to teach or reasonably suggest an optical pick-up having a lens holder having a bearing part, the lens holder being a molded product of a liquid crystal resin composition having a flexural elastic modulus of 10 GPa

or more, or a coefficient of maximum static friction between the lens holder and the bearing is 0.12 or less. The Examiner again notes that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In the instant case, Hirose discloses the main structural elements of the optical pick-up, i.e. a support shaft (See 2 in Figures 1, 2, 3), and an lens holder (See 8, 9 in Figures 1, 2, 3) having a bearing part (See 5, 10 in Figures 1, 2, 3) which fits on the supporting shaft rotatably, wherein the supporting shaft is formed of ceramics containing zirconia (See Abstract), and wherein the bearing part is a resin molding product (See col. 6, lines 19-47). However, Tachikawa et al. and Makabe et al. are being relied upon to provide teachings of the particular type of resin used to form the above lens holder having the bearing part, i.e. the resin being a liquid crystal polymer resin, the composition of which may be adjusted to achieve a desired elastic modulus (See in particular Claims 1, 20, col. 18, lines 13-20, Table 1 of Makabe et al.). However, the Examiner agrees that the combined teachings of Hirose et al., Tachikawa et al., and Makabe et al. do not teach or reasonably suggest a coefficient of maximum static friction between the lens holder and the bearing being 0.12 or less. The Examiner therefore respectfully withdraws the rejections to Claims 11-16, 18-20 in the Office Action dated 9/17/03.

7. Claims 1, 3-11, and 16 are now rejected as follows.

Claim Objections

8. Claims 1, 3-11 and 16 are objected to because of the following informalities:

Claim 1 recites the limitation "the cavity" in lines 8 and 9. There is insufficient antecedent basis for this limitation in the claim. Claims 3-9 are dependent on Claim 1, and hence inherit the deficiencies of Claim 1.

Claim 10 recites the limitation "the cavity" in lines 6 and 7. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "said bearing" in line 8. There is insufficient antecedent basis for this limitation in the claim. Claim 16 is dependent on Claim 11, and hence inherits the deficiencies of Claim 11.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 11 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 recites the limitation that '...wherein a coefficient of maximum static friction between said lens holder and said bearing is 0.12 or less.' It is unclear whether the bearing part of the lens holder or some other unspecified bearing is being specified here. Further, if one assumes the bearing part of the lens holder to be specified, then no

static friction between the lens holder and the bearing part can be specified since, according to the specification (See in particular 5 and 5b in Figure 2 of the instant application) the bearing part is an integral part of the lens holder. For the purposes of examination, the Examiner has taken this limitation to mean '...wherein a coefficient of maximum static friction between said lens holder and said *supporting shaft* is 0.12 or less.' Claim 16 is dependent on Claim 11, and hence inherits the deficiencies of Claim 11.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1, 3-4, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikegame et al. (U.S. Patent No. 6229778, of Ikegame '778), of record, in view of Hayakawa et al. (JP06027360A), of record, and Shoji et al. (U.S. Patent No. 4785434).

Ikegame '778 discloses an optical pick-up (See Figures 2, 3, 9, 10) comprising a support shaft (See 12 in Figure 10), and an lens holder (See 6 in Figure 10) having a bearing part (See the bore of 6 which is engaged with shaft 12 in Figure 10) which fits on the supporting shaft rotatably, wherein the lens holder is a resin molded product (See col. 8, lines 7-17) comprising a lens supporting part (See 6a in Figure 10) having a lens receiving surface (See surface on which element 21 rests in Figure 10), and the bearing

part having a bearing surface disposed vertically to the lens receiving surface (See surface on which element 21 rests and the bore of 6 which is engaged with shaft 12 in Figure 10) . Additionally, Ikegame '778 discloses the optical pick-up having a plurality of lens receiving surfaces disposed on it (see 4, 5, in Figures 2, 3) and the resin molded product being a liquid crystal resin composition (See col. 8, lines 7-17). Ikegame '778 lacks the resin molded product being injection molded and comprising a gate at an end of the bearing part disposed at an opposite side of the lens receiving surface and disposed parallel to an inside perimeter of the bearing part; and the gate being disposed between a cavity in a fixed template of an injection mold and a core pin for a bearing hole, the core pin being held in the cavity in the fixed template unconstrained. However, Hayakawa et al. teaches a method of producing a lens holder for an optical pick-up using an injection molding technique (See Figures 1, 2, 4) wherein the resin is injected into a dye through a gate (See 10 in Figures 1, 2, 4; Abstract) such that the gate is disposed parallel to the inside perimeter of the bearing part (See 4 in Figures 1, 2, 4). Hayakawa et al. additionally teaches that the position of the gate may also be moved to the circumference of the lens holder, as shown in Figures 3, 6, and 7. One skilled in the art would realize that the gate may be positioned anywhere on the surface of the lens holder, such as at an end of the bearing part disposed at an opposite side of the lens receiving surface (See recess next to 3 in Figures 1, 2, 4) or i.e. the gates 10 are located on the opposite side of where the are located in Figures 1, 2, 4, so long as the molten resin is injected to fill the entire mold or die to form the lens holder. The combined teachings of Ikegame '778 and Hayakawa et al. lack the gate being disposed between a cavity in a fixed template of an

injection mold and a core pin for a bearing hole, the core pin being held in the cavity in the fixed template unconstrained. However, Shoji et al. teaches a process for injection molding of a synthetic resin shaft and gear (See Abstract; Figures 5, 12), wherein the mold (See 23 in Figure 12A) for forming the desired part includes an upper half (See upper mold portion 23 of Figure 12A) and a lower half (See lower mold portion 23 of Figure 12A). Gates (See G in Figure 12A) are disposed between a cavity (See cavity portion between mold portions 23 in Figure 12A) in a fixed template of an injection mold and a core pin (See central pin extension from lower mold portion 23 in Figuer 12A) for a bearing hole, the core pin being held in the cavity in the fixed template unconstrained (See free end of central pin extension from lower mold portion near gates G in Figure 12A; it is noted that this free end is not fixedly connected to the upper mold portion, and hence is unconstrained at least in the lateral direction). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the resin molded product comprise a gate at an end of the bearing part disposed at an opposite side of the lens receiving surface and disposed parallel to an inside perimeter of the bearing part; and the gate be disposed between a cavity in a fixed template of an injection mold and a core pin for a bearing hole, the core pin being held in the cavity in the fixed template unconstrained, as taught by Hayakawa et al. and Shoji et al., in the optical pick-up of Ikegame '778 for the purpose of 1) improving dimensional accuracy of the bearing part as well as increasing the mechanical rigidity of the lens holder, and 2) provide increased mechanical strength since the resin orients itself in the flowing direction (See col. 8, line 60-col. 9, line 36).

13. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikegame '778 in view of Hayakawa et al. and Shoji et al. as applied to Claims 1 and 4 above, and further in view of either Tachikawa et al. (U.S. Patent No. 6375863), of record, or Makabe et al. (U.S. Patent No. 6153121), of record.

Ikegame '778 in view of Hayakawa et al. and Shoji et al. disclose the invention as set forth above in Claims 1 and 4 above, except for the resin molded product comprising at least one of a fibrous filler and a flake filler, and having flexural elastic modulus of 10 GPa or more. However, both Tachikawa et al. and Makabe et al. teach the use of resins, such as liquid crystal polymer resin, for producing precision moldings, such as of optical pick-ups. In particular, Tachikawa et al. teaches the use of liquid crystal polymer resins for molding optical pick-ups (See col. 20, line 23-col. 21, line 15) in which fillers and fibers have been incorporated to increase the mechanical strength and other characteristic properties. For example, fillers, such as mica, talc, glass fibers, or carbon fibers, are added to the liquid crystal polymer resin composition to increase the elastic modulus and shield electromagnetic waves (See col. 13, line 40-col. 18, line 25). Makabe et al. teaches the use of liquid crystal resins for molding optical pick-ups (See Claims 1, 17; col. 15, line 24-col. 16, line 6) in which fillers and fibers, such as mica, talc, glass fibers, and carbon fibers, have been incorporated to provide good mechanical properties (See col. 10, lines 14-26). Additionally, the amount of such fibrous and flake fillers into the liquid crystal polymer resin is adjusted to achieve a particular elastic modulus, such as 10 GPa or higher (See Claims 1, 20; col. 18, lines 13-20; Table 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to

have the resin molded product comprise at least one of a fibrous filler and a flake filler, and have flexural elastic modulus of 10 GPa or more, as taught by either Tachikawa et al. or Makabe et al., in the optical pick-up of Ikegame '778 in view of Hayakawa et al. and Shoji et al., for the purpose of adjusting the various properties, such as mechanical and electrical properties, of the final lens holder product based on the intended requirements.

14. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikegame '778 in view of Hayakawa et al. and Shoji et al. as applied to Claim 1 above, and further in view of Hirose et al. (U.S. Patent No. 6108143), of record.

Ikegame '778 in view of Hayakawa et al. and Shoji et al. disclose the invention as set forth above in Claim 1, except for the supporting shaft being formed of a zirconia-containing ceramic. However, Hirose et al. teaches an optical pick-up (See Figures 1, 2, 3) that is very similar to the claimed invention, wherein at least one of the supporting shaft (See 2 in Figures 1, 2, 3) and the bearing part (See 5, 10 in Figures 1, 2, 3) of the optical pick-up is formed of ceramics containing zirconia (See Abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the supporting shaft be formed of a zirconia-containing ceramic, as taught by Hirose et al., in the optical pick-up of Ikegame '778 in view of Hayakawa et al. and Shoji et al., for the purpose of increasing the dimension accuracy of the supporting shaft, thus allowing for higher accuracy positioning of the optical pick-up beam.

15. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirose et al. in view of either Tachikawa et al. or Makabe et al., and Ikegame et al. (U.S. Patent No. 5875166, or Ikegame '166).

Hirose et al. discloses an optical pick-up (See Figures 1, 2, 3) comprising a support shaft (See 2 in Figures 1, 2, 3), and an lens holder (See 8, 9 in Figures 1, 2, 3) having a bearing part (See 5, 10 in Figures 1, 2, 3) which fits on the supporting shaft rotatably, wherein the supporting shaft is formed of ceramics containing zirconia (See Abstract), and wherein the bearing part is a resin molding product (See col. 6, lines 19-47). Hirose et al. lacks the bearing part being a molded product of a liquid crystal resin composition having a flexural elastic modulus of 10 GPa or more, wherein the resin composition comprises 20-85 % by weight of an aluminum borate whisker based on the total weight of the resin composition, wherein a coefficient of maximum static friction between the lens holder and the supporting shaft is 0.12 or less. However, both Tachikawa et al. and Makabe et al. teach the use of resins, such as liquid crystal polymer resin, for producing precision moldings, such as of optical pick-ups. In particular, Tachikawa et al. teaches the use of liquid crystal polymer resins for molding optical pick-ups (See col. 20, line 23-col. 21, line 15) in which fillers and fibers have been incorporated to increase the mechanical strength and other characteristic properties. For example, fillers, such as mica, talc, glass fibers, carbon fibers or aluminum borate whiskers, are added to the liquid crystal polymer resin composition to increase the elastic modulus and shield electromagnetic waves (See col. 13, line 40-col. 18, line 25). Makabe et al. teaches the use of liquid crystal resins for molding optical pick-ups (See Claims 1, 17; col. 15, line 24-col. 16, line 6) in which fillers and fibers, such as mica, talc, glass fibers, carbon fibers, and aluminum borate whiskers, have been incorporated from 1 to 80 parts by weight (See Abstract, Table 1 for the inclusion of aluminum borate whiskers) to provide

good mechanical properties (See col. 10, lines 14-26). Additionally, the amount of such fibrous and flake fillers into the liquid crystal polymer resin is adjusted to achieve a particular elastic modulus, such as 10 GPa or higher (See Claims 1, 20; col. 18, lines 13-20; Table 1). The combined teachings of Hirose and either Tachikawa et al. and Makabe et al. lack a coefficient of maximum static friction between the lens holder and the supporting shaft being 0.12 or less. However, Ikegame '166 teaches an optical pick-up See for example Figures 1-2), wherein the coefficient of maximum static friction between the lens holder (See 7, 21 in Figure 2) and the supporting shaft (See 8, 9 in Figure 2) is less than 0.25 (See Abstract; col. 8, line 64-col. 9, line 32; col. 11, line 60-col. 12, line 3). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the bearing part be a molded product of a liquid crystal resin composition having a flexural elastic modulus of 10 GPa or more, wherein the resin composition comprises 20-85 % by weight of an aluminum borate whisker based on the total weight of the resin composition, wherein a coefficient of maximum static friction between the lens holder and the supporting shaft is 0.12 or less, as taught by either Tachikawa et al. or Makabe et al., and Ikegame '166, in the optical pick-up of Hirose et al., for the purpose of 1) adjusting the various properties, such as mechanical and electrical properties, of the final lens holder product based on the intended requirements, and 2) allow higher precision and finer tracking control of the optical pick-up, thus reducing residual errors.

16. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirose et al. in view of either Tachikawa et al. or Makabe et al., and Ikegame '166 as applied to Claim 11 above, and further in view of Ikegame '778.

Hirose et al. in view of either Tachikawa et al. or Makabe et al., and Ikegame '166 disclose the invention as set forth above in Claim 11, except for the lens holder including a plurality of object lens holes. However, Ikegame '778 teaches an optical pick-up device (See Figures 2, 3, 9, 10) that includes multiple object lens holes (See 4, 5, in Figure 2) in the lens holder (See 6 in Figure 2). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the lens holder include a plurality of object lens holes, as taught by Ikegame '778, in the optical pick-up of Hirose et al. in view of either Tachikawa et al. or Makabe et al., and Ikegame '166, for the purpose of providing enhanced read/write capabilities, particularly where multiple optical recording media, each with different optical characteristics, must read from/written to.

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Arnel C. Lavarias
4/1/04

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